What is claimed is:

[Claim 1] 1. An airfoil of a rotating component of a turbomachine, the airfoil having a coating system comprising:

a metallic coating on a surface of the airfoil, the metallic coating comprising metallic particles dispersed in a matrix having a metallic and/or intermetallic composition, the metallic particles being more ductile than the matrix and having compositions containing silver and optionally tin; and

a ceramic coating overlying the metallic coating;

wherein the metallic coating is sufficiently thick to damp vibration in the airfoil.

[Claim 2] 2. The airfoil according to claim 1, wherein the matrix consists essentially of chromium and chromium-based intermetallic phases formed by interaction between chromium and at least one of silver and tin in the metallic coating.

[Claim 3] 3. The airfoil according to claim 1, wherein the metallic particles have compositions chosen from the group consisting of alloys of silver, SnAg, and SnTiAg.

[Claim 4] 4. The airfoil according to claim 1, wherein the metallic coating is substantially free of tin.

[Claim 5] 5. The airfoil according to claim 1, wherein the metallic coating further comprises oxides chosen from the group consisting of oxides formed by oxidation of elements of the metallic particles, oxides formed by oxidation of the metallic composition of the matrix, and oxides from the ceramic coating.

[Claim 6] 6. The airfoil according to claim 1, wherein the metallic particles have nominal dimensions of less than one micrometer.

[Claim 7] 7. The airfoil according to claim 6, wherein at least some of the metallic particles have nominal dimensions of less than one micrometer.

[Claim 8] 8. The airfoil according to claim 1, wherein the ceramic coating has a composition comprising magnesia.

[Claim 9] 9. The airfoil according to claim 1, wherein a compositionally graded region is present between the metallic coating and the ceramic coating that contains material of the metallic coating and material of the ceramic coating.

[Claim 10] 10. The airfoil according to claim 1, wherein the metallic coating and the ceramic coating are substantially discrete layers separated by a distinct interface.

[Claim 11] 11. The airfoil according to claim 1, wherein the surface of the airfoil on which the metallic coating lies is defined by a metallic bond coat that promotes adhesion of the metallic coating to the airfoil.

[Claim 12] 12. The airfoil according to claim 10, wherein the metallic bond coat is predominantly hafnium, silver, or a mixture thereof.

[Claim 13] 13. A gas turbine engine blade formed of a titanium alloy and having a coating system comprising:

a metallic coating on a surface of the blade, the metallic coating comprising metallic particles dispersed in a matrix having a metallic and/or intermetallic composition, at least some of the metallic particles having nominal dimensions of less than one micrometer, the metallic particles having compositions containing silver, the matrix consisting essentially of chromium and chromium-based intermetallic; and

a ceramic coating overlying on a surface of the metallic coating;

wherein the metallic coating is sufficiently thick to damp vibration in the blade.

[Claim 14] 14. The gas turbine engine blade according to claim 13, wherein the metallic particles have compositions chosen from the group consisting of alloys of silver, SnAg, and SnTiAg.

[Claim 15] 15. The gas turbine engine blade according to claim 13, wherein the metallic coating is substantially free of tin.

[Claim 16] 16. The gas turbine engine blade according to claim 13, wherein the metallic coating further comprises oxides chosen from the group consisting of oxides formed by oxidation of elements of the metallic particles, oxides formed by oxidation of the metallic composition of the matrix, and oxides from the ceramic coating.

[Claim 17] 17. The gas turbine engine blade according to claim 13, wherein all of the metallic particles have nominal dimensions of less than one micrometer.

[Claim 18] 18. The gas turbine engine blade according to claim 13, wherein the ceramic coating consists essentially of magnesia.

[Claim 19] 19. The gas turbine engine blade according to claim 13, wherein a compositionally graded region is present between the metallic coating and the ceramic coating that contains

material of the metallic coating and material of the ceramic coating.

[Claim 20] 20. The gas turbine engine blade according to claim 13, wherein the metallic coating and the ceramic coating are substantially discrete layers separated by a distinct interface.

[Claim 21] 21. The gas turbine engine blade according to claim 13, wherein the surface of the blade on which the metallic coating lies is defined by a metallic bond coat that consists essentially of hafnium, optionally silver, and up to 25 weight percent of constituents that diffused from the metallic coating into the bond coat, the bond coat promoting adhesion of the metallic coating to the blade.

[Claim 22] 22. A method for depositing a coating system on an airfoil of a rotating component of a turbomachine, the method comprising the steps of:

ion plasma cleaning a surface of the airfoil;

depositing a metallic coating on the surface of the airfoil to a sufficient thickness to damp vibration in the airfoil, the metallic coating comprising metallic particles dispersed in a matrix having a metallic and/or intermetallic composition, the metallic particles being more ductile than the matrix and having compositions containing silver and optionally tin; and

depositing a ceramic coating overlying the metallic coating.

[Claim 23] 23. The method according to claim 22, wherein the matrix consists essentially of chromium and chromium-based intermetallic phases.

[Claim 24] 24. The method according to claim 22, wherein the metallic particles have compositions chosen from the group consisting of alloys of silver, SnAg, and SnTiAg.

[Claim 25] 25. The method according to claim 22, wherein the metallic coating is substantially free of tin.

[Claim 26] 26. The method according to claim 22, wherein the metallic coating further comprises oxides chosen from the group consisting of oxides formed by oxidation of elements of the metallic particles during deposition of the metallic coating, oxides formed by oxidation of the metallic composition of the matrix during deposition of the metallic coating, and oxides from the ceramic coating.

[Claim 27] 27. The method according to claim 22, wherein the metallic particles have nominal dimensions of less than one micrometer.

[Claim 28] 28. The method according to claim 27, wherein at least some of the metallic particles have nominal dimensions of less than one micrometer.

[Claim 29] 29. The method according to claim 22, wherein the ceramic coating has a composition comprising magnesia.

[Claim 30] 30. The method according to claim 22, wherein the metallic coating and the ceramic coating are deposited by physical vapor deposition.

[Claim 31] 31. The method according to claim 22, wherein the metallic coating and the ceramic coating are deposited so as to create a compositionally graded region therebetween that contains material of the metallic coating and material of the ceramic coating.

[Claim 32] 32. The method according to claim 22, wherein the metallic coating and the ceramic coating are deposited so as to be substantially discrete layers separated by a distinct interface.

[Claim 33] 33. The method according to claim 22, further comprising the step of depositing a metallic bond coat on the airfoil before depositing

the metallic coating, the metallic bond coat promoting adhesion of the metallic coating to the airfoil.

[Claim 34] 34. The method according to claim 33, wherein the metallic bond coat is predominantly hafnium, silver, or a mixture thereof.

[Claim 35] 35. The method according to claim 34, wherein the metallic bond coat consists essentially of hafnium, optionally silver, and up to 25 weight percent of constituents that diffused from the metallic coating into the bond coat.

[Claim 36] 36. The method according to claim 22, wherein the airfoil is formed of a titanium alloy.